THE BIBLIOMETRIC ANALYSIS FOR IDENTIFYING FUTURE RESEARCH ON HABITS OF MIND TOPIC

IDA YAYU NURUL HIZQIYAH[1,2], ARI WIDODO[1,*], SITI SRIYATI[1]

[1]Universitas Pendidikan Indonesia, Jl. Dr. Setiabudhi No. 229
Bandung, Indonesia
[2]Universitas Pasundan, Jalan Tamansari No. 6-8 Kota Bandung
Corresponding author: yayu.fkip.bio@unpas.ac.id

Abstract

Current learning does not only emphasize the value obtained but also the process. Through a meaningful process, students can learn and develop certain skills. If it is continuously carried out, the learning process carried out will become a pattern or habit of learning. These habits are known as the Habits of Mind. Therefore this paper aims to analyse research trends and potential developments on this topic. This study was conducted by bibliometric analysis. The researcher uses the keyword Habits of Mind in the Scopus database for a span of three years, namely from 2019 to 2021. The data is visualized using the help of several applications, namely Bibliometrix, Tableau, and VOS Viewers. The results show that research trends on the topic of Habits of Mind are themes related to technology, techniques, and related to teachers and students. In addition, several terms were also obtained which were combined with Habits of Mind, namely Scientific Habits of Mind, Engineering Habits of Mind, Inquiry Habits of Mind, and Social Habits of Mind

Keywords: Bibliometric study, Future research, Habits of mind, VOSViewers,

1. Introduction

Habits of mind are known as life and career skills which are translated into several aspects, namely leadership, time management, initiative and self-directed learning, effective collaboration with others, persistence, understanding and empathetic listeners, flexible thinking, thinking and communicating clearly and precisely, strive for accuracy, apply prior knowledge to new situations, and take risks with full responsibility [1]. Research related to the topic of Habits of Mind has been widely carried out. Even so, further researchers can research the same topic. But it needs to be ensured that what researchers do is not the same as previous research. So we need an empirical analysis that can show the position of the research. In addition, with the results of this analysis, the novelty of Habits of Mind research topics can also be mapped from year to year.

The analysis in question is a bibliometric analysis that uses statistical and mathematical calculations in analysing scientific journals [2]. Bibliometric analysis was carried out based on several indicators. Bibliometric indicators are directing researchers in evaluating the results of scientific research, examining the interaction between keywords so that they can produce a mapping of the field of science that is visualized with images [3]. Based on this description, the purpose of this study is to analyse opportunities for developing research on Habits of Mind. Given that a bibliometric study of Habits of Mind has never been done before.

2. Literature Review

The current learning process emphasizes the development of student's skills that are useful for their survival (see Fig. 1) [4,5]. Educators design learning oriented to the skills to be achieved [6]. However, it is possible that one learning can be used to hone several other skills [7]. This type of teaching will eventually form a new study habit for students, especially during the online learning period, of course, new study habits are needed.
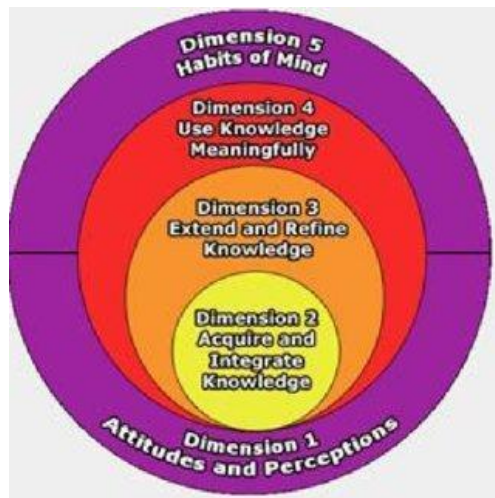

Fig. 1. Position of habits of mind.

Ownership of Habits of Mind is considered important for students at any level, therefore various studies have been carried out regarding this matter. Some researchers developed an instrument to measure the Habits of Mind of students [8]. Thus, it obtained as many as 16 items that represent each habit. After analysing the validity and reliability, the instrument can be used to measure the Habits of Mind. In addition, many studies directly measure the Habits of Mind of students, such as Alpusari et al. [9]. The research trend of Habits of Mind is also combined with various types of learning models and methods. However, before being combined, the teacher needs to analyse the characteristics of the selected model or learning because these models and methods will later be used to develop several skills that are shaded by Habits of Mind. For example, developing Habits of Mind through Project Based Learning. This is because thinking skills cannot be automatically developed through learning that emphasizes students to think only, but students are asked to make designs [10]. Project Based Learning is Contextual Teaching and learning that places more emphasis on solving authentic problems that occur every day through direct practical learning experiences in the community [11,12].

3. Method

We determined one keyword, namely "Habits of Mind" as the first stage. In the second stage, a search was carried out based on the criteria and obtained as many as 426 articles with the keyword "Habits of Mind" along with the year of publication starting from 2019 to 2021. The bibliometric data of articles was obtained through the Scopus database. Furthermore, in the third stage, the database obtained was processed using Biblioshyny for Bibliometrix and VOSviewer software. Detailed information on how to use VOSviewer is explained in elsewhere [3]. The output of the two applications provides the mapping of keywords related to Habits of Mind and other data. In the fourth stage, the visualization of Biblioshyny for Bibliometrix and VOSviewer was analysed by Co-word analysis. This analysis was carried out by applying clustering and social networks to reveal the intellectual structure of the Habits of Mind topic. Clustering is a method where objects are grouped because of a commonality. So that keywords that have a high correlation with each other tend to be included in the same cluster. In addition, keyword grouping is also carried out based on the year of publication and analysis of the documents with the most citations.

4. Results and Discussion

4.1. Keyword analysis

Figure 2 shows the keywords that are often used by the authors in writing articles related to Habits of Mind. These words lead to various assumptions on this topic. Therefore, to get a clearer picture, the Habits of Mind research related to these keywords is described. The first keyword is critical thinking.

Increasing students' Habits of Mind was due to students' thinking skills obtained through online learning. Students practice analysing, organizing, and solving problems [16]. The use of the Roleplaying method can also improve students' Habits of Mind, especially on indicators of creative thinking [17]. The next keyword is Collaboration. This word has a slightly larger size than the other words. This means that collaboration is a word that is often used by authors. If it is associated with Habits of Mind, then collaboration is problem-solving oriented.

Based on this, collaboration can be defined as an individual's capacity to effectively engage in a process in which two or more group members try to solve a problem by sharing the understanding and effort required to reach a solution and pooling their knowledge, skills, and efforts to reach that solution [18]. For example, some researchers discussed Habits of Mind by embedding Collaborative in one of its keywords [19]. This study aims to develop students' Habits of Mind through collaborative learning with a constructivist approach, namely 5E. The research was conducted to change the mindset of students in working together because we are placed in a group, the most important thing for them is the results obtained by the group, not the development of the skills of each individual. So that with designed learning, all can participate actively and cultivate Habits of Mind in students.

Fig. 2. Distribution of keywords in habits of mind topic.

The next keyword is Christian Herald. This keyword is quite interesting because it includes a person's name. After being traced, the Christian herald was used as the name of a weekly newspaper company in the US. His connection to Habits of Mind is when Robins reveals that in the era of premillennialism, people are easier to get along with social elite status, have liberal instincts, and are unusually Out of Mind [20]. The article aims to explain the social and cultural community. Based on the keyword analysis, the opportunity for developing the Habits of Mind topic was obtained. Such as those related to assessment, modeling, adaptive expertise, and others. However, not all keywords can be used as references, it is necessary to investigate these keywords and their relation to Habits of Mind. As previously explained, the Christian herald. Although there are authors who include it as a keyword in the Habits of Mind article, it has very little relation if the orientation is the development of students' Habits of Mind.

4.2. Published year analysis

Figure 3 shows the shift in the research trend from year to year which is represented by the words in the abstract. In 2019 and mid-2019, the theme of the Habits of Mind research was filled with several keywords, namely Inquiry Habits of Mind, Inquiry-based working, Assignment, Capacity to chance, and others. The term Inquiry Habits of Mind is closely related to conducting research. Characteristics of students who have Inquiry Habits of Mind are openness to ask questions when they feel confused, trying to build and test explanations, and mastery of information. The research was conducted by analysing the teacher's inquiry-based work and the students' Inquiry

Habits of Mind. Quantitatively, there was no relationship between the two, but it was related to students' curiosity and their habits of critical thinking. In 2019, in addition to research on Inquiry Habits of Mind owned by students, research related to teachers was also carried out, namely, Inquiry-based working. Inquiry-based working is the activity of teachers and other teaching teams to actively collect data that can improve student performance. In this case, the data in question is all data either at the school or class level. Research on this topic joins the Habits of Mind cluster because it relates to the habits of teachers in data literacy so they can consider new approaches to learning. In addition, the research identifies which aspects of Inquiry-based working are important drivers of capacity to change. These aspects are working with inquiry thinking habits, demonstrating data literacy, using data in the classroom, and using data at the school level. These aspects are significant in promoting increased capacity for change (capacity to change).
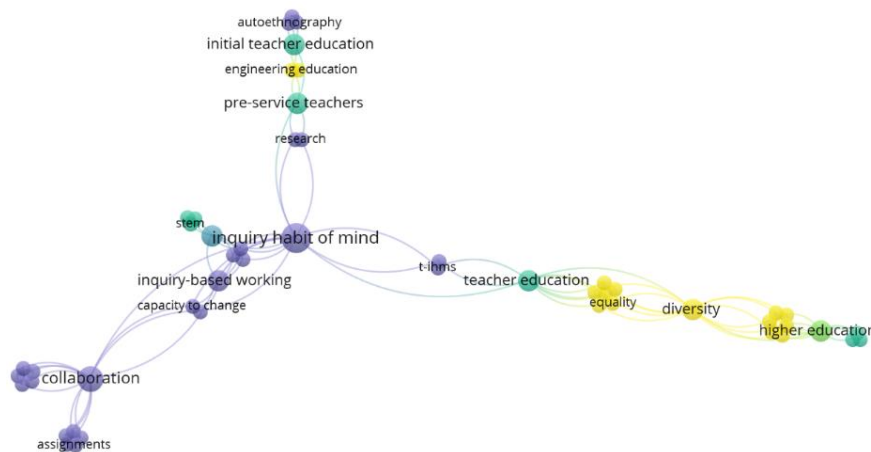

Fig. 3. Keywords based on published year.

4.3. Quadrant Analysis

In a theme, keywords and their interconnections draw a network graph, which is called a thematic network. Each network theme is labeled using the name of the most significant keyword in the related theme, this can be seen from the circle shape that houses several keywords.

If you have determined the theme to be researched based on keyword analysis, then the decision-making needs to be re-examined by looking at its position in the research quadrant as shown in Fig. 4. In the first quadrant or motor themes, there are several themes, namely diversity, higher education, teacher education, and collaboration. The next quadrant is the second quadrant which is located on the upper left side. This quadrant is filled with one theme, although the picture is not very clear, it can still be read that the topic in this quadrant is critical thinking. The themes in this quadrant have well-developed internal ties but less relevant external ties so only a few are judged to be important for the field. The third quadrant is a quadrant filled with themes that develop weakly and marginally. This quadrant theme has a low density and low centrality, mainly representing emerging or disappearing themes. This quadrant is filled with the themes of metacognition and Habits of Mind. This information can provide an idea when researching Habits of

Mind which is associated with metacognition. Supporting articles for the research is still lacking because they are in the third quadrant. Next is the lower right quadrant, which is filled with Inquiry Habits of Mind, curiosity, and inquiry-based working. The themes are important to the field of research areas of research but are not developed. This quadrant group is general or is called the basic topic.

This result also confirms the effectiveness of bibliometric analysis [21-30] to explore and visualize the current literature that can be used for deciding whether further research be done.
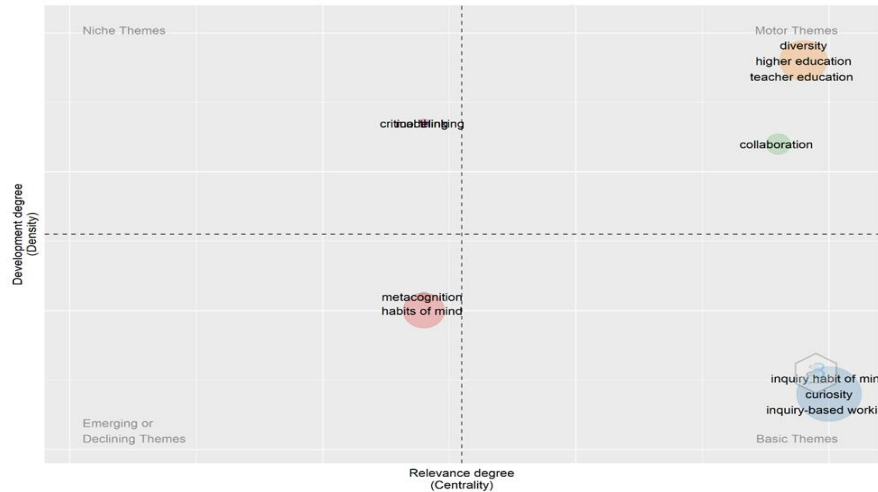

Fig. 4. Quadrant analysis.

5. Conclusion

The bibliometric analysis carried out shows that there is still a very large opportunity to develop research on Habits of Mind. Keyword analysis shows themes that can be developed, namely assessment, modeling, adaptive expertise, and others. This is supported by an analysis of the year of publication, where the latest research shows innovations made by teachers to carry out learning. Meanwhile, the analysis of the most cited documents illustrates that the research related to Habits of Mind that is in great demand is related to technology, computational knowledge, techniques and Habits of Mind owned by teachers.

References

1. Ball, A.; Joyce, H.D.; and Anderson, D. (2016). Exploring 21st century skills and learning environments for middle school youth. *International Journal of School Social Work*, 1(1), 1–15.

2. Nandiyanto, A.B.D.; and Al Husaeni, D.F. (2022). Bibliometric analysis of engineering research using voxviewer indexed by Google scholar. *Journal of Engineering Science and Technology*, 17(2), 883–894.

3. Al Husaeni, D.F.; and Nandiyanto, A.B.D. (2022). Bibliometric using Vosviewer with publish or perish (using google scholar data): From step-by-step processing for users to the practical examples in the analysis of digital

learning articles in pre and post covid-19 pandemic. *ASEAN Journal of Science and Engineering*, 2(1), 19-46.

4. Maison.; Darmajid.; Kurniawan, D.A.; Astalini, U.P.; and Kartina, L. (2019). Analysis of science process skills in physics education. *Jurnal Penelitian Dan Evaluasi Pendidikan*, 23(2), 197–205.

5. Qodriyani, H.I.; Aloysius, S.; and Suyanto, S. (2020). Effectiveness of teacher professionalism in the science process skills of students. *Jurnal Pendidikan Indonesia*, 9(4), 666–674.

6. Garreta-domingo, M.; Sloep, P.B.; Hernández-leo, D.; and Mor, Y. (2017). Learning design for teacher professional development. *International Journal of Educational Technology in Higher Education*, 14(36), 19–21

7. Yulyani, R.D. (2018). The effect of teaching techniques and learning styles to improve students ' speaking skill. *Journal of Language Learning*, 2(2), 48–59.

8. Akdeniz, H.; and Ekici, G. (2019). A development of the habits of mind inventory. *European Journal of Education Studies*, 5(11), 198–215.

9. Alpusari, M.; Putra, R.A.; Hermita, N.; Mulyani, E.A.; Putra, A.D.; and Widyanthi, A. (2020). Identifying the habits of mind prospective primary school teachers' in universitas Riau. *International Journal of Scientific & Technology Research,* 9(01), 2901–2905.

10. Lestari, D.; Sudarmin.; and Haryani, S. (2015). Pengembangan instrumen penilaian habits of mind pada pembelajaran ipa berbasis proyek tema pencemaran lingkungan untuk siswa SMP. *Unnes Science Education Journal*, 4(1), 796–806.

11. Guo, P.; Saab, N.; Post, L.S.; and Admiraal, W. (2020). A review of project-based learning in higher education : Student outcomes and measures. *International Journal of Educational Research,* 102, 1-13.

12. Rini, T.A.; Cholifah, T.S. (2020). Electronic module with project based learning: Innovation of digital learning product on 4.0 era. *Jurnal Kajian Teknologi Pendidikan,* 5(2), 155-161.

13. Ruiz-real, J.L.; Uribe-toril, J.; Valenciano, J.D.P.; and Gázquez-abad, J.C. (2018). Worldwide research on circular economy and environment : A bibliometric analysis. *International Journal of Environmental Research and Public Health*, 15, 1–14.

14. Piccirillo, I.N.; Fernando, L.; Almeida, M.; De Queiroz, L.; Júnior, D.A.; and Luis, S. (2018). Design structure matrix and project management : Bibliometric analysis. *Product Management and Development*, 15(2), 86–91.

15. Arifah, N.; Asikin, M.; and Dwijanto. (2021). Students mathematics creative thinking skills reviewed by habits of mind on probing-prompting learning with open-ended approach. *Unnes Journal of Mathematics Education Research*, 11(1), 42–47.

16. Hizqiyah, I.Y.; Sriyati, S.; Riyani, D.; and Rosamsi, S. (2019). The web-oriented constructivism instruction ap proach to improve student's habits of mind. *Jurnal Pembelajaran Biologi: Kajian Biologi dan Pembelajarannya*, 6(1), 11–21.

17. Yandhari, I.A.V.; Supartini.; Pamungkas, A.S.; and Khairunnisa, E. (2019). The role of habits of mind (hom) on student's mathematical problem solving skills of primary school. *Al-Jabar: Jurnal Pendidikan Matematika,* 10(1), 47-57

18. Child, S.; and Shaw, S. (2016). Collaboration in the 21st century : Implications for assessment. *Research Matters*, *Summer,* 1(22), 17–22

19. Chen, R.H. (2021). Fostering students' workplace communicative competence and collaborative mindset through an inquiry-based learning design. *Educational Sciences,* 11(17), 1-13

20. Robins, R.G. (2021). Evangelicalism before the fall : The christian herald and signs of our times. *Religions*, 12(504), 1–24.

21. Fauziah, A.; and Nandiyanto, A.B.D. (2022). A bibliometric analysis of nanocrystalline cellulose production research as drug delivery system using VOSviewer. *Indonesian Journal of Multidiciplinary Research*, 2(2), 333-338.

22. Al Husaeni, D.F.; and Nandiyanto, A.B.D. (2022). Bibliometric computational mapping analysis of publications on mechanical engineering education using vosviewer. *Journal of Engineering Science and Technology*, 17(2), 1135-1149

23. Al Husaeni, D.F.; and Nandiyanto, A.B.D. (2022). Bibliometric computational mapping analysis of publications on mechanical engineering education using vosviewer. *Journal of Engineering Science and Technology*, 17(2), 1135-1149.

24. Al Husaeni, D.N.; and Nandiyanto, A.B.D. (2023). Bibliometric analysis of high school keyword using VOSviewer indexed by google scholar. *Indonesian Journal of Educational Research and Technology*, 3(1), 1-12.

25. Al Husaeni, D.N.; Nandiyanto, A.B.D.; and Maryanti, R. (2023). Bibliometric analysis of special needs education keyword using VOSviewer indexed by Google Scholar. *Indonesian Journal of Community and Special Needs Education*, 3(1), 1-10.

26. Nordin, N.A.H.M. (2022). A bibliometric analysis of computational mapping on publishing teaching science engineering using VOSviewer application and correlation. *Indonesian Journal of Teaching in Science*, 2(2), 127-138.

27. Nugraha, S.A.; and Nandiyanto, A.B.D. (2022). Bibliometric analysis of magnetite nanoparticle production research during 2017-2021 using VOSviewer. *Indonesian Journal of Multidiciplinary Research*, 2(2), 327-332.

28. Piccirillo, I.N.; Fernando, L.; Almeida, M.; De Queiroz, L.; Júnior, D.A.; and Luis, S. (2018). Design structure matrix and project management: Bibliometric analysis. *Product Management and Development*, 15(2), 86–91

29. Ruiz-real, J.L.; Uribe-toril, J.; Valenciano, J.D.P.; and Gázquez-abad, J.C. (2018). Worldwide research on circular economy and environment: A bibliometric analysis. *International Journal of Environmental Research and Public Health*, 15(12), 1–14.

30. Shidiq, A.P. (2023). A bibliometric analysis of nano metal-organic frameworks synthesis research in medical science using VOSviewer. *ASEAN Journal of Science and Engineering*, 3(1), 31-38.

31. Hamidah, I.; Sriyono, S.; and Hudha, M.N. (2020). A bibliometric analysis of Covid-19 research using VOSviewer. *Indonesian Journal of Science and Technology*, 5(2), 209-216.

32. Setiyo, M.; Yuvenda, D.; and Samue, O.D. (2021). The concise latest report on the advantages and disadvantages of pure biodiesel (B100) on engine performance: Literature review and bibliometric analysis. *Indonesian Journal of Science and Technology*, 6(3), 469-490.

33. Nandiyanto, A.B.D.; Ragadhita, R.; Al Husaeni, D.N.; and Nugraha, W.C. (in press). Research trend on the use of mercury in gold mining: Literature review and bibliometric analysis. *Moroccan Journal of Chemistry*.

34. Gunawan, B.; Ratmono, B.M.; Abdullah, A.G.; Sadida, N.; and Kaprisma, H. (2022). Research mapping in the use of technology for fake news detection: Bibliometric analysis from 2011 to 2021. *Indonesian Journal of Science and Technology*, 7(3), 471-496.

35. Mudzakir, A.; Rizky, K.M.; Munawaroh, H.S.H.; and Puspitasari, D. (2022). Oil palm empty fruit bunch waste pretreatment with benzotriazolium-based ionic liquids for cellulose conversion to glucose: Experiments with computational bibliometric analysis. *Indonesian Journal of Science and Technology*, 7(2), 291-310.